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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Bernd Bruchmann

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EXAMINER

GILLESPIE, BENJAMIN

ART UNIT

PAPER NUMBER

1796

NOTIFICATION DATE

DELIVERY MODE

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ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/586,650	<b>Applicant(s)</b> BRUCHMANN ET AL.	
	<b>Examiner</b> BENJAMIN J. GILLESPIE	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-9 and 11-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-9 and 11-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/29/2009 has been entered.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. The U.S. Supreme Court supplied seven rationales in *KSR International v. Teleflex Inc.* (550 USPQ2d 1385) that, by following the factual inquiries set forth in *Graham v. John Deere Co.* (383 U.S. 1, 148 USPQ 459 (1966)), establish a *prima facie* case of obviousness. The rationales are:

- (a) Combining prior art elements according to known methods to yield predictable results;

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- (b) Simple substitution of one known element for another to obtain predictable results;
- (c) Use of known technique to improve similar devices (, methods, or products) in the same way;
- (d) Applying a known technique to a known device (, method, or product) ready for improvement to yield predictable results;
- (e) “Obvious to try” – choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- (f) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- (g) Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

5. The examiner notes that the above rationales are merely exemplary. For more information, see MPEP §2141.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

### **Obviousness Rejection I**

7. **Claims 1-3, 5-9, 11-12, 15, and 17-20** are rejected under 35 U.S.C. 102(b) as being anticipated by Rannard et al (GB 2 324 797) in view of Osterloh et al (US 4,713,440) and Gerkin et al (US 5,364,924).

8. **Regarding claims 1 and 9:** Rannard et al teach functionalized, branched, polyurea that is produced by reacting carbonyl diimidazole (CDI) with tri-functional polyamine – said polyamine contains both primary and secondary amine groups. It should be noted that CDI has a urea

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structure and the polyamine has a functionality of 3. Example 3 teaches the reaction performed in the presence of solvent, in the absence of catalyst, and under-reduced pressure (Page 19).

Finally, page 17 lines 18-19 teach that the polyurea can be subjected to subsequent functional modification after the branching has completed – this is taken to satisfy the language

“subsequent functionalization.” Still, Rannard et al ('797) fail to teach urea other than CDI.

9. Osterloh et al also teach branched polyurea that is useful as a surface coating and is the reaction product of (A) urea and (B) polyamine. (Abstract; col 1 lines 33-40). Therefore, it would have been obvious to also include urea as an amine-reactive compound since it is disclosed by Osterloh et al as being useful as the amine-reactive compound for analogous polyurea and it is *prima facie* obvious to add a known ingredient for its known function. *In re Linder* 173 USPQ 356; *In re Dial et al* 140 USPQ 244. Additionally, one of ordinary skill would have a reasonable expectation of success in substituting the CDI of Rannard et al for the urea of Osterloh et al since Gerkin et al teach on column 3 lines 15-19 that urea and CDI are suitable equivalents when reacted with polyamine.

10. **Regarding claim 2:** Rannard et al teach that the desired degree of branching in the final polyurea is controlled by introducing difunctional compounds into the reaction system, thereby reducing the number of branches, however, Rannard et al fail to teach diamine as a suitable difunctional urea reactant (Page 11 lines 18-22).

11. Osterloh et al teach the branched polyurea can be produced by reacting (A) urea with (B) polyamine, wherein the polyamine comprises *both* (Bi) diamine and (Bii) triamine. In particular (Bi) consists of compounds such as butylenediamine, hexamethylenediamine, heptamethylenediamine, and octamethylenediamine, and (Bii) consists of tri-functional

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polyamine, such as tris(aminoethyl)amine (Col 2 lines 15-48). Therefore, it would have been obvious to include both triamine and diamine in Rannard et al since Osterloh et al teach it as a suitable reactant in an analogous reaction system, and the presence of additional difunctional reactant it allows the user to further control the desired degree of branching.

12. **Regarding claim 3:** Rannard et al teach polyamine comprising bis(hexamethylene) triamine, N-(2-aminoethyl)-propane-1,3-diamine, and tris(2-aminoethyl)amine (Page 10 lines 1-3; page 14 line 31).

13. **Regarding claim 5:** The polyamine of Rannard et al are tri-functional.

14. **Regarding claim 6:** As discussed in paragraph 8, Rannard et al teach solvent.

15. **Regarding claims 7, 8, and 15:** Although Rannard et al teach the react of (A) urea and (B) polyamine in the presence of solvent, there is no mention of the specific solvents listed in claim 7 or that said reaction can take place in the an absence of solvent.

16. Therefore, applicants' attention is again directed back to Osterloh et al, which teach that toluene, xylene, and/or hydrocarbons, i.e. decane, dodecane – make useful solvents (Col 5 lines 40-45). Thus it would be obvious to include the solvents of Osterloh et al in Rannard et al since they are disclosed as being useful for the production of an analogous branched polyurea.

17. Regarding claims 8 and 15, while Rannard et al fail to explicitly teach that solvent may be omitted and the examples show the inclusion of solvent - Rannard et al never definitively states that solvent is required. Furthermore, Osterloh et al states that the relied upon process “*can* be carried out” in the presence of solvent – the language “*can*” is optional and therefore said reaction can also take place in the absence of a solvent. Thus it would have been obvious to also

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omit solvent since it is disclosed by Osterloh et al as a suitable practice for the production of analogous polyurea.

18. **Regarding claim 11:** Rannard et al does not require a catalyst (Page 14 line 28).

19. **Regarding claims 12-13 and 15:** Rannard et al states that “the reaction with primary amine *can* be carried out at ambient temperature in the absence of catalyst”, i.e. catalyst is optional and therefore can be omitted *or included*.

20. What’s more, Osterloh et al teach the polyurea is produced by reacting polyamine and urea in the presence of catalyst. In particular said catalyst comprises organotin compounds – such as dibutyltin dilaurate (Col 5 lines 17-25). Therefore, it would have been obvious to include the catalyst of Osterloh et al in Rannard et al since they are disclosed by Osterloh et al as being useful in the production of analogous polyurea and one of ordinary skill would understand said catalyst would help the secondary amines react with the remaining urea.

21. **Regarding claim 17:** As discussed in paragraph 13 – example 3 of Rannard et al teaches reduced pressure which would result in distillation of the liberated amine.

22. **Regarding claims 18 and 19:** As discussed in paragraph 13, polyurea *can* be subjected to subsequent functional modification after the branching has completed – i.e. “subsequent functionalization” may or may not occur.

23. **Regarding claim 20:** The reaction occurs at room temperature (Page 10 line 5).

**Obviousness Rejection II**

24. **Claims 12-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rannard et al ('797) in view of Osterloh et al ('440) and Gerkin et al ('924) in view of D'Alelio (US 2,340,045).

25. **Regarding claims 12-15:** As previously discussed, the prior art renders obvious a method of making branched polyurea by reacting urea and polyamine in the presence of catalyst. Still the prior art fails to teach all of the catalyst in claims 13 and 14.

26. D'Alelio teach reactions between polyamine and various urea compounds wherein said reaction is preferably catalyzed with potassium carbonate (Right column of page 1, lines 50-55; left column of page 3, lines 49-52). Therefore, it would have been obvious to include potassium carbonate catalyst in the process of Rannard et al since it is disclosed by D'Alelio as being useful in aiding the reaction between urea and amine groups, and it is prima facie obvious to add a known ingredient for its known function. *In re Linder* 173 USPQ 356; *In re Dial et al* 140 USPQ 244.

**Obviousness Rejection III**

27. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Rannard et al ('797) in view of Osterloh et al ('440) and Gerkin et al ('924).

28. **Regarding claim 16:** As previously discussed the prior art renders obvious a method for producing branched polyurea by reacting polyamine and urea. This reaction is conducted under a vacuum – which would result in the removal of liberated amine. Therefore, Rannard et al fail to explicitly teach that said liberated amine should not be distilled off.

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29. Nevertheless, it still would have been obvious to refrain from said distillation since example 3 explains that the distilled product is a "sticky solid" – i.e. the removal of the liberated amine results in an increase in viscosity. Thus by keeping the liberated amine in with the branched polyurea would provide the user with a composition that is easily transferable to various containers without the need for introducing additional solvent.

### **Obviousness Rejection III**

30. **Claims 12, 15, 17, and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rannard et al ('797) in view of Osterloh et al ('440) and Gerkin et al ('924) in view of Rannard et al (Non-Patent Literature Publication).

31. **Regarding claims 12, 15, 17 and 21:** As previously discussed the prior art render obvious a method of making branched polyurea by reacting (A) urea and (B) polyamine in the presence of catalyst, wherein (B) comprises both primary and secondary amine functionality. Still there is no mention of reacting (A) and (B) at temperatures between 60 and 180°C.

32. Rannard et al (Non-Patent Literature Publication) also teach polyurea that is produced by reacting (A) urea and (B) polyamine – the reaction can take place with the addition of heating the system to 60°C.

### ***Response to Arguments***

33. Applicant's arguments with respect to claims 1-3, 5-9, 11-21 have been considered but are moot in view of the new ground(s) of rejection. The newly presented rejection presents prior

art – Gerkin et al (US 5,364,924) – that establishes a reasonable expectation of success in substituting CDI for urea when reacting with polyamine systems.

34. If applicants' maintain that it would not be obvious to substitute CDI with urea, it should be noted that the difference in reactivity between CDI and urea does not establish the claimed invention as being unobvious. The prior clearly establishes that when branched polyurea is produced by reacting polyamine with urea-functional material, one of ordinary skill would understand that CDI *and* urea are suitable equivalents. One of ordinary skill would understand how to modify the operating conditions in order to account for the slower reaction speed of urea when compared to CDI.

### ***Conclusion***

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENJAMIN J. GILLESPIE whose telephone number is (571)272-2472. The examiner can normally be reached on 8am-5:30pm.

36. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on 571-272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

37. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Milton I. Cano/  
Supervisory Patent Examiner, Art Unit 1796

/Benjamin J Gillespie/  
Examiner, Art Unit 1796